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Title : FORAGING DIVES OF FIN WHALES: ARE THEY TIME- OR ENERGY-MAXIMIZERS?

Category : Behavior

Student : Not Applicable

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Abstract : The question of how air-breathing vertebrates allocate dive time requires identifying the currency they maximize: if proportion of foraging time, divers should choose the shallowest possible dive; if energetic gain, divers should dive deep if prey availability increases with depth. Fin whales (*Balaenoptera physalus*) provide an ideal species to examine this question since they feed on aggregations of euphausiids, which congregate at depth in dense patches during the day and scatter near the surface at night. Thus fin whales should forage at night if maximizing foraging time and during the day if maximizing energetic gain. We attached time-depth recorders to eight whales to describe their dive profile and employed echosounders to acoustically measure the vertical density of euphausiids. The study was conducted in La Paz and Loreto bays, Mexico, at a time of the year in which fin whales prey on euphausiids. Fin whales foraged almost exclusively during the day (proportion of dives that were foraging dives: $46.1 \pm \text{SD } 20.33\%$ day, $10.3 \pm \text{SD } 10.81\%$ night; $G1=192.17$, $p<0.001$) while foraging dive depth averaged $113.6 \pm \text{SD } 30.09$ m during the day and $44.0 \pm \text{SD } 8.33$ m at night. Euphausiids were distributed at $107.5 \pm \text{SD } 19.82$ m during the day and $50.0 \pm \text{SD } 25.64$ m at night. Thus time of day had a significant effect on the depth at which both foraging whales dove and euphausiids occurred (ANOVA $F_{1,23}=106.23$, $p<0.001$). However, the depth of foraging dives was not different from the depth at which the maximum concentration of euphausiids was encountered regardless of time of day (ANOVA $F_{1,23}=1.20$, $p=0.284$). Results indicate that fin whales foraged during the day at depth on dense patches of euphausiids, thus supporting the hypothesis that they maximized energetic gain.